Step-by-Step
MAHD
Modified Agile for Hardware Development

The Smart Coffee Maker Project

Part 2 of a 9-part series to walk through an agile development project from concept to launch

Step 2:

The Agile Project Kickoff Meeting

By Dorian Simpson and Gary Hinkle

INTRO TO MAHD

A Quick Intro to MAHD

Agile methods have proven superior over traditional product developement processes to quickly adapt to customer needs, reduce waste and accelerate development. However, the application of agile requires significant changes to support the needs of hardware products. This led to the development of the Modified Agile for Hardware Development (MAHD) Framework — an open-source initiative to embrace the principles of agile while recognizing hardware's unique needs.

THE COFFEE MAKER PROJECT: STEP-BY-STEP AGILE IN NINE STEPS

To help practitioners visualize the MAHD Framework, we have developed a series of nine articles to explain how agile methods and tools can be used for physical products, who should be involved, the deliverables for each step and tips for how to overcome challenges. We hope you'll join us on this journey as JavaBrew uses the MAHD Framework to develop an innovative new coffee maker.

YOU ARE HERE

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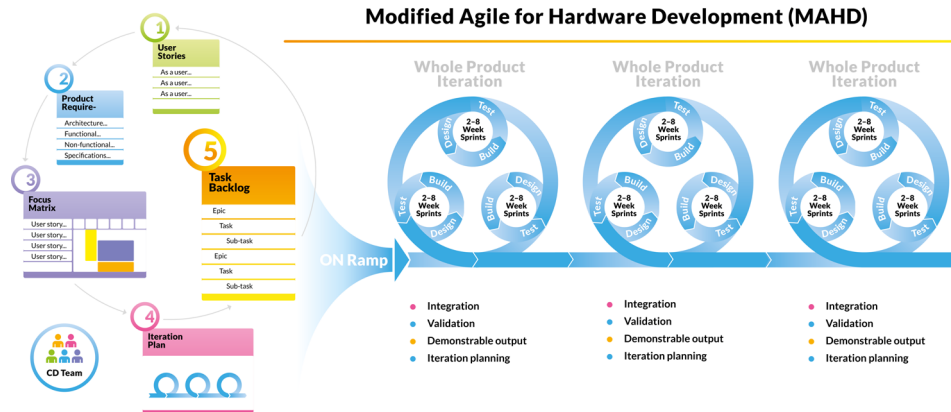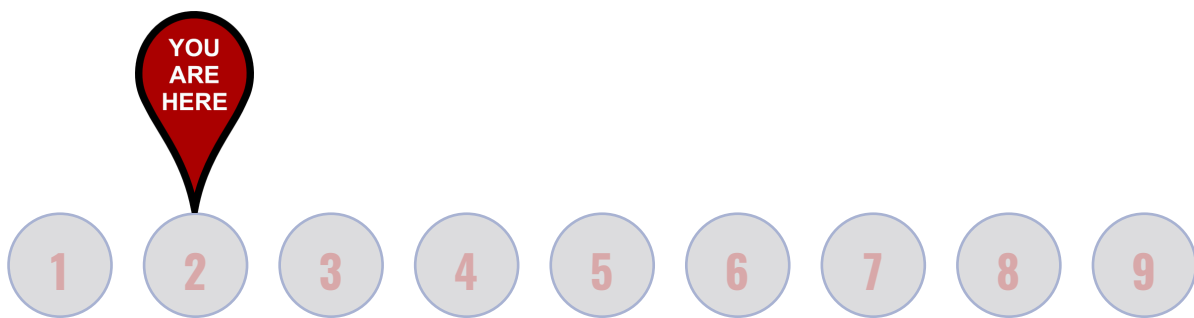
The MAHD Framework: Similar to Agile for Software, but with Important Differences

Learn More

To learn more about the MAHD Framework, download related ebooks and whitepapers, or sign up for e-learning opportunities, visit **www.agileforhardware.org.**

STEP 2: SITUATION

Step 2: The Agile Project Kickoff Meeting

THE SITUATION

Lynda, a product manager at JavaBrew is preparing to kick off an agile project using the Modified Agile for Hardware Development (MAHD) framework for the first product in a roadmap of "smart" coffee makers – The JavaBrew Smart Maker 2020. In the previous step in this series, Lynda prepared an Agile Product Brief along with high level user stories. She is now ready to gather the team to explain the project's goals, user needs and get the project started with the development team.

In this step, she has called a meeting with the key stakeholders to kick off the project with several goals in mind:

1. Communicate the target market and business objectives for the product
2. Review the Agile Product Brief and user stories for clarity
3. Brainstorm the major product attributes as part of the MAHD On-ramp
4. Identify all of the major project elements using an Agile Project Checklist
5. Identify any preparation needed for the next step – Iteration Planning

It's now Tuesday afternoon and the team has gathered in their project room ready for action.

AGILE ACTIVITIES

At this point, it's important to involve all project team leaders including R&D leads, designers, testing leads, production managers and other functional leads. It is not necessary to include all team members now since the leadership team is still working on the big picture. The systems engineering lead, Jordan, has agreed to serve as the agile project manager, splitting his time between engineering work and project management responsibilities. His role as the agile project manager is to drive the agile process and ensure the team meets all objectives and goals described in the Agile Product Brief. Lynda's role as Product Owner is to represent customers and senior management, making team decisions as needed on behalf of stakeholders as well as providing updates about customer and business needs.

Once the team meets, Lynda leads the team discussion and starts by presenting the market situation, target customer and product goals. Next, the team reviews the user stories for clarity and they discuss any story that is unclear and what it might mean for customers. They then begin to brainstorm the anticipated major attributes and requirements not described by user stories that are necessary to deliver the product. They use the remainder of their meeting time to complete an Agile Project Checklist.

They leave the meeting with more questions, than answers, as shown in the exhibits below, but they know questions will be answered through the agile process.

STEP 2: OUTCOMES

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The Exhibits on the following pages show the results of the Agile Kick-off Meeting.

Exhibit 1: Kick-off Meeting Notes

Lynda and Jordan captured team member concerns ranging from cost, to schedule to market acceptance along with comments and major action items. Many of these will likely become part of the backlog they'll develop in an upcoming step.

Exhibit 2: Product Attributes and Requirements

The team decided to categorize attributes by functional discipline. They discussed whether to group them by product function, such as "Human Interface" which might include elements across disciplines, but since each team leader would be responsible for their own deliverables, they felt the categories shown would be easier to manage and assign tasks.

Exhibit 3: The Agile Project Checklist

The team agreed that all elements on the checklist are needed, except that deviations/waivers should not be required for compliance. They will include these planning elements in their backlog and work towards completing the plan in their early sprints.

NEXT STEP

The team will meet again in one week to complete their initial Iteration Plan that will outline the milestones and key deliverables, estimate the project duration, develop a prototype plan and consider the major dependencies that determine the schedule. Early focus areas will also be considered, including opportunities for creating differentiaton through innovation, how to manage the project risk, and identify the key questions that need answers.

Before the Iteration Planning meeting, each functional lead will review the Agile Product Brief more deeply to identify concerns and determine if major attributes/requirements need to be added. They will also think about their functional approach and be prepared to contribute to the overall plan.

EXHIBIT 1

Exhibit 1: Meeting Notes

Capturing the ideas, concerns and issues of the project

After reviewing Lynda's Agile Project Brief, the team had a wide range of comments and concerns.

1. The major concern was the target release date. The team had not completed a project of this complexity in 18 months. With so many unknowns, was this possible? They agreed to review this as part of Iteration Planning (the next step).

2. The cost target of $100 seemed unreasonable, especially with the new smart features. Their current premium maker already had a cost of over $100 and they think the new features will add significant costs.

3. The user stories were too high level. Lynda needed to supply more details for the R&D team to focus faster and not waste time getting clarity where needed. She promised more details by the end of the first iteration once the team had learned more.

4. The team was excited to work on this new product. The R&D team has been thinking about smart features and was anxious to incorporate their work into a real product. (Privately, Lynda had concerns the R&D team would focus more on the cool features they were working on rather than real customer needs.)

5. There was much debate on the value and implementation of using voice control on a coffee maker. One of the respected designers, Kevin, stated, "I don't think customers really want this. It just adds complexity and we could do much better with a phone app." The team agreed this would need to be resolved quickly in the agile process.

6. Resources and access to team members with the right skills was raised as a big concern. The team was unsure of how to estimate the number of people they would need until the product was more defined.

EXHIBIT 2

Exhibit 2:
Product Attributes and Requirements

Describing the JavaBrew Smart Maker from the product perspective

Category	Attribute/Requirement	Discussion
Physical Design	Color Choices	OK with one color option for first product? TBD
	Material	Stainless steel has higher perceived value, but might not hit price target.
	Industrial design	Develop a whole series "smart" design? TBD. High-end product must be reliable.
	Coffee grinding	Blades are cheaper, but less consistent and more prone to breaking. Current premium using grinding. Blades if cost target critical?
	Flexible size control	Reuse existing designs?
	Filter type	Innovative re-usable design.
	Water reservoir	Size requirement? Designer to review optimal.
	Carafe style/design	Insulated? Glass? TBD
	Interface?	If voice/app controlled, do we need a full interface on the device?
Electrical Design	Grinding/water control	Using previous designs should be OK. TBD
	Button/touch interface	Physical buttons? Touch? Ideally the interface matches the mobile app. TBD
	Wireless interface	WiFi required. Bluetooth option?
	Electrical Compliance	2020 launch U.S. market only?
Software	Coffee control	Can reuse much of current code.
	Mobile App	Keep it simple.
	Voice Control	How much control do Alexa commands allow? Needs research.
Packaging/Materials	Retail package	Premium product will require premium package.
	Manual	Keep it minimal – Download the app!
	Legal disclaimers	Reuse previous – new privacy language.
Other	Molds	TBD
	Testing	Can our team test smart features? Review skill set. Reliability testing critical for high-end product.

Exhibit 3: Agile Project Checklist

Identifying the project needs beyond user stories and attributes

Element Needed?	Project Plan Elements
Project Description	
Done – Product Brief	Project overview
Done – Product Brief	Flexibility matrix (Scope/time/cost prioritization)
No	Policy exceptions, process deviations, waivers…
Yes – "Smart" tech terms	Glossary of terms
Ongoing – Product Brief	User stories
Yes – revisit each sprint	Features not included or supported
Yes – need reuse plan	Reuse
Yes	Product / system architecture / major components
Document smart features	Theory of operation
Yes – challenging target	Production cost estimates
Resource Plan	
Yes – staffing concerns	Project staffing and cross-functional support
Yes	Roles and responsibilities
Yes	External resources
Yes – smart features	Training plan
Done – Product Brief	Financial resources and budget
Yes – manufacturing	Capital expenses, equipment and tools
Project Management Plan	
Yes	Iteration plan
Yes	Communication plan
Yes	Quality assurance plan
Yes	Risk Mitigation
Yes	Project metrics and KPIs
Standard procedures	Revision/document control and configuration management
Yes	Change management
Yes	Project reviews
Yes	Defect tracking
Development Plan	
Yes	Technical approach and innovation
Yes	Manufacturing considerations
Yes – DFM/E/R	Design for "X" (DfX)
Yes	Documentation plan
Yes – patents	Intellectual property management
Yes	Product attributes
Yes	High-level test/verification/validation plan
Yes	Release/launch plan

EXHIBIT 3

To Be Continued...

GET THE SERIES

To see the previous steps and receive each new step of this project as it is published, visit **www.AgileForHardware.org**. Each step will be available for download and sent directly to your email.

ABOUT THE AUTHORS

The MAHD framework is an open-source process, available for all to use, build on and improve. We look forward to hearing from you and your experiences with agile, waterfall and other processes. The MAHD framework was developed by Gary Hinkle and Dorian Simpson to address the needs of hardware development.

To learn more, get involved, or just join our community for discussion, visit:

www.AgileforHardware.org

About Gary Hinkle

Electronics, mechanical and software engineering are all part of Gary Hinkle's background, working in design, management and executive leadership of communication, industrial, telemetry, audio, avionics, computers, test & measurement, among other industries. Today, he's principal consultant at Auxilium, a company he founded to help engineering-oriented businesses increase productivity.

Contact Gary
W: www.Auxilium-inc.com
P: 971-222-6234
E: gary@auxilium-inc.com

About Dorian Simpson

Dorian Simpson is an innovation and product development consultant, trainer, speaker and author of *The Savvy Corporate Innovator*. Companies he's worked with include ABB, Tyco, Owens Corning, Technicolor, FEI, VTech and Freightliner. Before consulting, Dorian held positions at Motorola and AT&T in product management, sales, marketing, business development, and engineering.

Contact Dorian
W: www.KingsleyInst.com
P: 971-235-4905
E: dorian@kingsleyinst.com

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